Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1 through 30 (Canceled).

31. (Previously presented) A process for cleaning a substance from a reactor surface, said process comprising:

providing a reactor containing the reactor surface, wherein: (a) the reactor surface is at least partially coated with a film of the substance; (b) the substance is at least one member selected from the group consisting of a transition metal oxide, a transition metal silicate, a Group 13 metal oxide, a Group 13 metal silicate, a nitrogen containing Group 13 metal oxide, a nitrogen containing Group 13 metal silicate, a nitrogen containing transition metal oxide, a nitrogen containing transition metal silicate, or a laminate comprising at least one layer selected from the group consisting of a transition metal oxide, a transition metal silicate, a Group 13 metal oxide, a Group 13 metal silicate, a nitrogen containing transition metal oxide, a nitrogen containing transition metal silicate, a nitrogen containing Group 13 metal oxide, or a nitrogen containing Group 13 metal silicate; and (c) the substance has a dielectric constant greater than the dielectric constant of silicon dioxide;

reacting the substance with a reactive agent comprising at least one fluorine-containing compound and at least one halogen-containing compound selected from a chlorine-containing compound, a bromine-containing compound, or an iodine-containing compound wherein the amount of fluorine-containing compound is less than 50% by volume of an amount of the halogen-containing compound; and

removing the volatile product from the reactor to thereby remove the substance from the surface.

32. (Previously presented) The process of claim 31 wherein the reactor is an atomic layer deposition reactor.

33. (Previously presented) The process of claim 31 wherein the substance is at least one member selected from the group consisting of Al_2O_3, HfO_2, ZrO_2, $HfSi_xO_y$, $ZrSi_xO_y$, where x is greater than 0 and y is 2x + 2, $Al_2Si_wO_z$, where w is greater than 0 and z is 2w + 3, or any of the aforementioned compounds containing nitrogen.

34. (Previously presented) The process of claim 31 wherein the substance is a laminate comprising layers of at least one material selected from the group consisting of a transition metal oxide, a transition metal silicate, a Group 13 metal oxide, a Group 13 metal silicate, a nitrogen containing transition metal oxide, a nitrogen containing transition metal silicate, a nitrogen containing Group 13 metal oxide, or a nitrogen containing Group 13 metal silicate.

35. (Previously presented) The process of claim 31 wherein the reactive agent comprises the chlorine-containing compound.

36. (Previously presented) The process of claim 35 wherein the chlorine-containing compound is at least one selected from the group consisting of BCl_3, $COCl_2$, HCl, Cl_2, ClF_3, and NF_zCl_{3-z}, where z is an integer from 0 to 2.

37. (Previously presented) The process of claim 35 wherein the chlorine-containing compound is $COCl_2$ formed by an in situ reaction of CO and Cl_2.

38. (Previously presented) The process of claim 35 wherein the chlorine-containing compound is BCl_3.

39. (Previously presented) The process of claim 35 wherein the chlorine-containing compound is a compound having the formula $C_xH_yCl_z$, wherein x is a number ranging from 1 to 6, y is a number ranging from 0 to 13, and z is a number ranging 1 from 14.

40. (Previously presented) The process of claim 31 wherein the reactive agent is conveyed to the substance from a gas cylinder, a safe delivery system, or a vacuum delivery system.

41. (Previously presented) The process of claim 31 wherein the reactive agent is formed in situ by a point-of-use generator.

42. (Previously presented) The process of claim 31 wherein the substance is contacted with the reactive agent diluted with an inert gas diluent.

43. (Previously presented) The process of claim 31 wherein the reactive agent is deposited onto a nonreactive support.

44. (Previously presented) A process for removing a substance from at least a portion of the surface of a reaction chamber, the process comprising:

providing a reaction chamber wherein at least a portion of the surface is at least partially coated with the substance and wherein the substance has a dielectric constant of 4.1 or greater and is at least one member of the group consisting of a transition metal oxide, a transition metal silicate, a Group 13 metal oxide, a Group 13 metal silicate, a nitrogen containing Group 13 metal oxide, a nitrogen containing Group 13 metal silicate, a nitrogen containing transition metal oxide, a nitrogen containing transition metal silicate, or a laminate comprising at least one layer of the group consisting of a transition metal oxide, a transition metal silicate, a Group 13 metal oxide, a Group 13

metal silicate, a nitrogen containing Group 13 metal oxide, a nitrogen containing Group 13 metal silicate, a nitrogen containing transition metal oxide, a nitrogen containing transition metal silicate;

introducing a reactive agent into the reaction chamber wherein the reactive agent comprises at least one fluorine containing compound and at least one halogen-containing compound selected from a chlorine-containing compound, a bromine-containing compound, or an iodine-containing compound wherein the amount of fluorine-containing compound is less than 50% by volume of an amount of the halogen-containing compound;

exposing the reactive agent to one or more energy sources sufficient to react the substance with the reactive agent and form a volatile product; and

removing the volatile product from the reaction chamber.

45. (Previously presented) The process of claim 44 wherein the reactive agent further comprises at least one member selected from the group consisting of a boron-containing compound, a carbon-containing compound, a hydrogen-containing compound, a nitrogen-containing compound, a chelating compound, a chlorosilane compound, a hydrochlorosilane compound, and an organochlorosilane compound.

46. (Previously presented) The process of claim 44 wherein the reactive agent is exposed to one or more energy sources and the exposing step is conducted prior to the introducing step.

47. (Previously presented) The process of claim 44 wherein the reactive agent is exposed to one or more energy sources and the exposing step is conducted during at least a portion of the introducing step.

48. (Previously presented) The process of claim 44 wherein a temperature of the exposing step is at least 150 °C.

49. (Previously presented) The process of claim 44 wherein a pressure of the exposing step is at least 10 mTorr.

50. (Withdrawn) A mixture for removing a substance from at least one surface of a reactor, the mixture comprising:

an at least one reactive agent comprising a fluorine containing compound and at least one halogen-containing compound selected from a chlorine-containing compound, a bromine-containing compound, or an iodine-containing compound wherein the amount of fluorine-containing compound is less than 50% by volume of an amount of the halogen-containing compound; and

an inert diluent.

51. (Withdrawn) The mixture of claim 50 wherein the reactive agent further at least one selected from a boron-containing compound, a carbon-containing compound, a hydrogen-containing compound, a nitrogen-containing compound, a chelating compound, a chlorosilane compound, a hydrochlorosilane compound, and an organochlorosilane compound